Critical thinking: From the online environment to the multicultural classroom

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Abstract

There is minimal evidence to show that instructional design (where communication and critical thinking is a crucial part of the learning process in the classroom) has catered for ethnic groups for whom English is not their first language. Computer-mediated communication can provide a social aspect to learning where interaction involves an exchange of information and requires participants to formulate arguments or reorganise material to arrive at new relationships or concepts (Graham & Scarborough, 1999).

This paper demonstrates the use of the video and online discussion forums as part of a 'layered learning technique' as a tool for developing critical thinking. It shows the results of a pilot study of how prior exposure to activities and materials integrated within a structured online discussion forum can effectively facilitate interaction and discourse among students of ethnic origins and help them acquire critical thinking skills.

Keywords

Critical thinking, multicultural, computer-mediated communication, online discussion forum

The problem

The discipline of Advertising requires a number of higher-order generic skills, such as decision making, risk taking, negotiation, and critical thinking (CT) skills. These skills underlie effective oral and written communication skills that are essential for graduates to effectively contribute and participate in discursive dialogues in the advertising business arena. *Advertising Management* (AMN420) and *Media Strategy* (AMN422) are subjects that demand the acquisition and application of these skills in the real world of Advertising practice. These are postgraduate subjects in the School of Advertising, Marketing and Public Relations (AMPR), under the Faculty of Business (FOB) at Queensland University of Technology (QUT). Postgraduate enrolment in these subjects has a 50% rate of students coming from overseas, in particular, students from the Asia-Pacific region, and therefore students whose first language is not English. Their participation in face-to-face (F2F) discussion forums have been minimal, with Australian students whose first language is English, as dominating the contributions in the classroom discussions. For this cohort of students, it was difficult to assess the acquisition of CT skills, either as oral or explicit behaviour as in discussions, and ensure that they can be effective contributors to the planning and management of advertising campaigns and projects in the workplace. A review of the FOB assessment shows critical thinking (CT) as a generic skill more often assumed to have been acquired based on the marking received by a student through workshops, problem-based projects, formative assessment activities, criterion-referenced assessment and participation in discussion forums (QUT, 2003). This commonly used assessment strategy, however, does not facilitate the development of and the measurement of the student's immediate CT skills that often require the processing of short-term and long-term memory within a short and limited space of time. This is what often occurs and is demanded during discussions and negotiations taking place in the Advertising boardroom.

This project looked at utilising computer-mediated tools of moderated online discussions and integrated multimedia to provide multiple access and utilisation of the subject material, a process of 'layering' (Evelyn Wood Technique cited in Schwartzman, 2002). The layering process employed in this study (see methodology) allowed students to preview and review the learning materials using a number of electronic media prior to the discussions taking place. Information is processed at three levels: individual, online and F2F discussions. It is the CT processes translated from the online into the F2F discussions in the multicultural classroom environment that was the focus in this study. The study attempted to answer the hypothesis: The use of online discussion forums will help facilitate CT in F2F classroom discussion among students whose first language is not English. The study focuses on three aspects of learning: critical thinking and its cognitive process of formation; the use of computer-mediated communication, specifically online discussion forums, in developing critical thinking; and how multicultural learners learn.

Critical thinking (CT)

Critical thinking is a higher-order cognitive process that is demonstrated by a range of behaviours from evaluating arguments, expressing judgments to inferences, theory or proposing solutions to a problem and analysing possible consequences (McKenzie & Murphy, 2000). Astleitner (2002) and Frampton (1994) further refine the definition to include conceptual, methodical and contextual considerations upon which the judgment is based. Therefore, it is a skill that is demonstrated by deep processing characterised by organised thought, justified argumentation and the ability to relate new knowledge with previously learned knowledge. Clearly, theorists of cognitive science are in agreement that the simple regurgitation and repetition of information is not intellectual behaviour that demonstrates higher-order thinking skills. Educational theorists and practitioners alike are in concurrence, as evidenced by a review of the goals and mission statements in discipline-specific curriculum and to the extent that CT impacts on the development of generic skills and the capacity for lifelong learning (Arons, 1985; Oliver & McLoughlin, 2000; QUT Manual of Policies and Procedures, 2003).

We ask the question, 'How does critical thinking take place in the cognitive domain?' To develop critical thinking core information must first be processed through working memory. Working memory is where current mental activity takes place. Because it is short in both duration and capacity only a limited amount of information can be held and processed (Chandler, Cooper, Pollock & Tindall-Ford, 1998). It is when information has been successfully processed in working memory that it becomes part of long-term memory. Information stored in long-term memory can be used as information chunks and drawn from to organise

and structure new information, a process of higher intellectual behaviour, such as problem solving and critical thinking (Egan & Schwartz, 1979; and Jeffries, Turner, Polson, & Atwood, 1981).

Computer-mediated communication (CMC) in learning

Interactivity has been a term used to promote the use of computer-enhanced learning environments almost callously and without regard as to its true role in the learning process. Sims (2000) offers a framework of interactivity constructs that can be used to guide the use of computer-based activity to enhance the learning process, through the dimensions of the learner, content, pedagogy and context. The basis for developing an interactive learning activity will most likely rely on use of one or more of these constructs founded on sound theory. As a social interactive process it is a teaching support tool for teachers to develop collaborative learning (Cecez-Kecmanivic & Webb, 2000). An online discussion forum, in particular, is an effective medium for developing this social interactive process allowing participants to organise and reorganise information, create their own conceptual framework based on the threaded discussions from other participants as well as being able to receive feedback. It is the analysis, in-depth processing and recall of course material in the response-feedback cycle that forms the basis for which Kaye (1992) claims to have greater benefit derived through this medium. Its social dimension is clear in the conversational interchange, allowing for discursive, interactive and reflective communication to take place, a framework that strongly supports the learning process and for purposes of educational evaluation (Laurillard, 1993; and Svensson, 2002).

How effective online discussion forums are in facilitating a discursive environment is dependent on a number of factors, including making it a key and integral part of the learning structure and environment (McKenzie & Murphy, 2000), role of the teacher as moderator and maintaining the student-teacher dialogue (O'Reilly & Newton, 2002), and ensuring that the interface design and hypertext links to resources are intuitive, easy to navigate through and allow self-directed learning (Brown, 1997), not to mention easy access to the online medium and resources.

Multicultural learners

Learning behaviours that seem to dominate South-east Asia, Hong Kong and China include rote learning (Chan, 1999). According to Biggs (1994), rote learning can be defined as a learning mechanism that does not include thought or meaning whereby the learner fails to understand the real meaning of the information or material learnt. According to Chan (1999), previous studies imply that students found to depend on the rote method of learning often lack originality of the thinking process. The research reveals South-east Asian and Chinese students attend a majority of lectures that provide minimal discussion or question time during the course of the lecture. Problem solving in a classroom environment also appears to be neglected. It seems that their assessment is largely achieved through written examinations that do not examine the ability to work with others and identify practical problems. Chan further questions the benefits of another method of learning known as *repetitive learning* which enables the students to recall information and attach a meaning to the material presented. Biggs (1994) suggests learning in the Western style does include students being taught to use abstract frameworks when conceptualising the information, be metacognitive when planning and monitoring their progress, and make outcomes well structured and integrated. For most international students, this process is undertaken silently. According to Chan (1999), long silences in class do not necessarily imply international students are refusing to participate; they may just be thinking more about the question and may need more input or probing from the teacher. Many students feel hesitant to participate in classroom discussion because of communication apprehension (CA) with 15% to 20% of tertiary students suffering from high CA (Tanian 2002); 60% suffer anxiety and all students do suffer to some degree anxiety throughout their studies (McCosky 1997). Yau (1994) implies students will feel more comfortable interacting with one another in a classroom environment once relationships between themselves and others within the room have been defined. They are also more likely to seek one-on-one interaction with the teacher once the lecture is over and with one another, as opposed to Western students (Biggs 1994). Merrier and Dirks (1997) imply that students know they must contribute in classroom discussion; however, the fear of failure and nerves can cause them to avoid speaking in front of other students. Chan (1999) proposes the need for westerners to be more sympathetic to the individual cultural needs and learning differences of international students. This emphasis on catering for individual learning styles impacts on the design and implementation of learning materials and methods of instruction.

Methodology

AMN420 and AMN422 were taught over a thirteen-week semester. Consent to voluntarily participate in the study was solicited from the students by the researchers. It was explained that all subject-specific information and data gathered would be kept confidential. The layering process is described below.

Individual processing: Handouts, presentations and case studies

The first level of information processing was based on individual access to lecture handouts, presentations and case studies through the Online Learning and Teaching (OLT) system. Handouts and presentations were uploaded on the OLT system during the first week of the semester; they had clear statements of the objectives for the topic and the requirements for the week. Students were expected to have read and reviewed the learning materials prior to their attendance in online discussions and classroom lectures.

A series of case studies in video format was developed in order to provide a virtual workplace scenario for the students to process two weeks prior to the online discussion forum. The web site was called ‘QUT Advertising Consultancy’. Haaken & Christensen (1999) have advocated the use of multimedia technology as allowing access to real-world scenarios through a virtual workplace boardroom, a medium that was used successfully within the Faculty to develop generic skills (Radbourne, 2002). An innovation implemented in this study was to present real-world case studies in video clips to present Advertising managers and their clients negotiating and discussing issues relevant to real advertising campaigns in Australia. The virtual case studies provided students with the following benefits: familiarity with the advertising agencies and advertising campaigns being discussed; issues discussed in the case studies were relevant to current practices in the Advertising field; access to experts and practitioners in the industry who shared first-hand experience and information to the students; and discussions between managers of the advertising agency

and their clients were written, developed and implemented by them within the context of the topic assigned for the week of the discussions.

Each case study was presented through a series of streaming video clips in order to provide easy access to 'chunks' of information that students could easily go back to for review purposes. Information can be selected, reviewed and re-selected as the learner assimilates knowledge and forms their conceptual framework. The case studies (Table 1) were used as the basis for online discourse of the topics.

AMN420: Case study 1	**Advertising Agency: Publicis Mojo**
This case study focuses on advertising management issues and considerations in the life of an Account Director. It includes relationships between clients and the agency and between the various service departments and employees of the agency. Discusses political, social and ethical underpinnings that play a role in decision-making processes. Provides an overview of a personal experience and first-hand consultation of how to manage problems within an advertising agency.	
AMN422: Case study 1	**Advertising Agency: Publicis Mojo** **Client: Personalised Plates Queensland (PPQ)**
PPQ is an organisation that sells personalised plates to motorists in Queensland, Australia. It is a profit organisation to help fund road and traffic developments. Publicis Mojo was contracted as the advertising agency to promote to motorists personalised number plates, a campaign to appeal to both the young and older generations. The case study describes the campaign issues, evaluation of the campaign and strategies.	
AMN422: Case study 2	**Advertising Agency: HMA Blaze** **Client: Queensland RSL (Girl in a Million Quest)**
The Returned and Services League (RSL) of Australia is an organisation supporting returned and current serviceman, women and their families. HMA Blaze is a mainstream advertising agency contracted by RSL Queensland to promote their 'RSL Girl in a Million Quest'. The campaign sought to attract women to participate in a fund raising event. The case study is a boardroom scenario where advertising issues, budget and media strategies are discussed.	

Table 1. Case studies

Online discussion forums

Online discussion forums and other computer-mediated learning techniques have been used and advocated with increasing frequency by teachers and researchers to facilitate the development of problem-based learning (Oliver & Omari, 1995) and collaborative learning (Cecez-Kecmanovic & Webb, 2000); and increase learning interactions and teamwork (Draper, Cargrill & Cutts, 2002; Franklin & Peat, 2001; Graham & Scarborough, 1999; McLoughlin, 2002). Evaluation methods of online discussion forums often have the problem of relying on the level of activity online as indicative of the level of learning acquired (Mason, 1992). The studies of Gunawardena, Lowe and Anderson (1998); Henri (1993); Romiszowski and Mason (1996); and McKenzie and Murphy (2000) have found that in order to assess true acquisition of learning via online mediums, in-depth content analysis should be undertaken of the discussion record. McKenzie and Murphy (2000) used an adaptation of Henri's model (1992, 1993) based on analysing the rate and type of participation, structure, interactivity and cognitive and metacognitive dimensions to evaluate the effectiveness of online discussion groups in a mainly asynchronous environment.

The teaching of critical thinking requires a context-based approach to the use of strategies and techniques and demands that teachers providing the instruction participate in the skills development process versus 'seeking the counsel of outsiders with little knowledge of the local context' (Browne, 1999; Golding, Marginson & Pascoe, 1996; Misko, 1995). The online discussion forums for AMN420 and AMN422 were teacher-moderated and conducted in place of selected weekly lecture sessions so there was greater incentive for students to log in and join the online discussion. Prior to the online discussion forum session, a number of questions were prepared by the teacher, requiring lower-order to higher-order cognitive demand processes. Attendance was expectedly high because of the teacher-moderated nature of the instructional design. It was the quality of participation and the demonstration of CT that needed to be evaluated.

Face-to-face/Classroom discussion

The online discussion forum was followed by a face-to-face session where a review and summary of the online discussion was provided. The review process was followed by a lecture discussion of the new topic. The same criteria for questioning in the online discussion forum were applied in the classroom. Questions asked during the F2F and online discussions were classified into two types: declarative (D) and critical thinking (CT) questions. The former are questions that would elicit declarative or elementary responses and, therefore, initiated surface process learning, while the latter elicited in-depth to strategic type responses, initiating deep learning processes. The number of D and CT questions asked during the F2F and online discussions were dependent on the topic being presented at the time of the discussion. Online and F2F discussions that took place centred on a weekly topic and therefore questions asked during both sessions were related.

Response coding

The cognitive skills dimension of Henri's model (1992, 1993) was used as the criteria by which responses were coded based on a demonstration of both surface and deep learning processes.

Code	CT Levels	Behavioural Response
A	Elementary Clarification (surface processing)	Asked relevant questions, clarifications, introduced a problem, passed on information without elaboration, suggesting a solution without explanation
B	In-depth Clarification (deep processing)	Analyses a problem and identifies assumptions, contributed further information to the discussion AND elaborates on the topic, presents a wider view, shows links and interprets meaning of expressions
C	Inference and Judgment (deep processing)	Provided opposing or supporting arguments to the discussion, providing reasons and grounds for claims, expresses a judgment about an inference, relevance of an argument, theory or solution
D	Strategy (deep processing)	Proposes a solution; outlines what is needed to implement the solution, provides analysis of possible consequences

Table 2: Critical thinking skills coding levels

As two international students had declined to participate, videotaping the F2F discussions was not possible. Therefore, observers needed to code the responses manually. Independent observers were appointed, trained and calibrated to conduct the coding of the responses during the face-to-face discussions and transcripts of the online discussion forums. The following training considerations were paramount to ensure reliability of data:

- One-hour workshop on coding critical thinking according to levels followed by a one-hour coding within an actual Advertising lecture. The training and calibration process ensured that all observers would provide congruent coding as their understanding of the meaning of each critical thinking level is the same.
- Resolution of discrepancy between observer coding formed part of the training. Where a disagreement between coding was found, the reasons were discussed and a consensus of the coding decided.

Two independent paired observers, online discussion (OD) and face-to-face discussion (FD) observers, were each asked to code the responses in the online and lecture discussions (post-online), respectively. OD observers coded the online discussion transcripts while the FD observers attended the lecture discussions, recorded the questions asked by the lecturer and coded the responses to each question presented. Questions raised by the lecturer could vary during the course of the discussion; therefore, the questions were written down by the FD observers as they were asked. The coding also differentiated between the groups of students who had English as their first language (EFL) and those who did not have English as their first language (ENFL). Each group was coded by coloured squares attached to the backrest of students' chairs at the beginning of the class. To avoid students being able to determine group identity, the four colour codes varied between sessions and within groups. Observer coding sheets contained descriptors and examples for

each level of critical thinking. Attendance and colour code assignments were recorded for each group. Marking columns allowed observers to create separate records for EFL and ENFL responses.

Subjects

Two classes formed the sample population for the study, both having a mix of Australian and international students. For the purposes of this study, permanent and non-permanent residents were counted as international students. International students whose first language was English were classified under the EFL group along with the Australian students. AMN422 had more international students at 54% *versus* 44%. The sample groups had the following characteristics:

- AMN420 and AMN422 students generally had undergraduate (82% and 83%) and a smaller proportion of post-graduate (17% and 17%) qualifications, the highest being 83%. and 92% came from 21–30 age group for AMN420 and AMN422, respectively.
- In comparing the computer usage of the AMN420 and AMN422 students, considered in terms of EFL and ENFL groupings, both groups showed similar usage across various computer mediums.
- EFL AMN422 and ENFL AMN420 groups had more experience using various computer communication mediums. ENFL AMN420 students showed the highest usage (69%) of newsgroups which differed by 36% from the ENFL AMN422 group.
- The percentage distribution of student experiences in using each medium across ENFL groups shows that only 44% have used online discussion forums compared to 57% for the EFL groups with ENFL AMN422 showing the lowest usage at 33%.
- A very high Internet use of 95% was found across the population samples.
- A difference noted was among ENFL students of AMN422 whose behavioural patterns show a higher tendency to discuss the study materials with their peers (33% versus 0% for EFL groups in both classes).

Analysis and evaluation of data

In order to determine the response behaviour of EFL and ENFL students to CT and D question types, the mean values of the coded responses was summarised across all sessions for both AMN420 and AMN422 (Tables 3 and 4).

CT Question Type	English First Language*				English Not First Language*			
	A	B	C	D	A	B	C	D
Online 1 (13.03.03)	6.00	6.25	0.50	0.13	4.75	4.57	1.63	0.13
Online 2 (10.04.03)	2.00	11.33	2.33	0.00	5.67	6.33	2.33	0.00
Online 3 (01.05.03)	2.40	2.60	1.20	0.40	3.00	1.80	0.20	0.00
Online 4 (22.05.03)	1.80	2.00	1.00	0.00	1.60	1.60	0.60	0.20
Online Mean	**3.05**	**5.55**	**1.26**	**0.13**	**3.75**	**3.58**	**1.19**	**0.08**
Post-Online 1 (20.03.03)	0.67	1.67	1.67	0.33	1.33	0.33	0.33	0.00
Post-Online 2 (08.05.03)	1.25	0.50	0.25	0.00	1.50	0.50	0.00	0.00
Post-Online 4 (29.05.03)	0.50	0.50	0.17	0.00	0.33	1.00	0.17	0.00
Post-Online F2F Mean	**0.81**	**0.89**	**0.69**	**0.11**	**1.06**	**0.61**	**0.17**	**0.00**
Group Mean	**2.09**	**3.55**	**1.02**	**0.12**	**2.60**	**2.31**	**0.75**	**0.05**
Pre-Test (06.03.03)	1.00	1.00	0.20	0.00	0.40	0.20	0.00	0.00

D Question Type	English First Language*				English Not First Language*			
	A	B	C	D	A	B	C	D
Online 1 (13.03.03)	9.00	4.00	0.25	0.00	8.75	3.25	0.50	0.00
Online 2 (10.04.03)	3.50	7.17	1.67	0.00	4.83	5.67	1.17	0.00
Online 3 (01.05.03)	2.00	1.00	1.00	0.00	2.00	1.00	0.00	0.00
Online 4 (22.05.03)	2.00	3.00	0.00	0.33	0.67	2.00	0.00	0.00
Online Mean	**4.13**	**3.79**	**0.73**	**0.08**	**4.06**	**2.98**	**0.42**	**0.00**
Post-Online 1 (20.03.03)	1.71	3.13	0.75	0.25	1.29	0.50	0.25	0.00
Post-Online 2 (08.05.03)	1.00	0.50	0.00	0.00	1.00	1.00	0.00	0.00
Post-Online 4 (29.05.03)	0.40	0.60	0.20	0.00	0.80	0.00	0.00	0.00
Post-Online F2F Mean	**1.04**	**1.41**	**0.32**	**0.08**	**1.03**	**0.50**	**0.08**	**0.00**
Group Mean	**2.80**	**2.77**	**0.55**	**0.08**	**2.76**	**1.92**	**0.27**	**0.00**
Pre-Test (06.03.03)	1.50	2.00	0.17	0.00	0.33	0.17	0.00	0.00
EFL Group Mean	**2.45**	**3.16**	**0.78**	**0.10**				
ENFL Group Mean	**2.68**	**2.11**	**0.51**	**0.02**				

*A: Elementary B: In-depth C: Judgment D: Strategy

Table 3: AMN420 Summary of Mean Values (N = 42, n = 41)

CT Questions	English First Language*				English Not First Language*			
	A	B	C	D	A	B	C	D
Online 1 (19.03.03)	4.33	3.80	1.33	1.00	2.83	2.17	0.33	0.00
Online 2 (09.04.03)	4.00	10.00	9.00	2.00	6.00	6.00	2.00	0.00
Online Mean	**4.17**	**6.90**	**5.17**	**1.50**	**4.42**	**4.08**	**1.17**	**0.00**
Post-Online 1 (16.04.03)	1.57	0.83	0.29	0.00	0.57	0.00	0.00	0.00
Post-Online 2 (08.05.03)	1.00	0.00	0.00	0.00	2.00	2.00	0.00	0.00
Post-Online F2F Mean	**1.29**	**0.42**	**0.14**	**0.00**	**1.29**	**1.00**	**0.00**	**0.00**
CT Group Mean	**2.73**	**3.66**	**2.65**	**0.75**	**2.85**	**2.54**	**0.58**	**0.00**
Pre-Test (05.03.03)	10.00	14.00	8.00	3.00	6.00	7.00	4.00	0.00

D Questions	English First Language*				English Not First Language*			
	A	B	C	D	A	B	C	D
Online 1 (19.03.03)	4.67	2.17	0.00	0.00	3.00	0.60	0.50	0.00
Online 2 (09.04.03)	0.00	4.00	0.00	2.00	0.00	3.00	0.00	0.00
Online Mean	**2.33**	**3.08**	**0.00**	**1.00**	**1.50**	**1.80**	**0.25**	**0.00**
Post-Online 1 (16.04.03)	4.00	1.00	0.50	0.00	0.75	0.25	0.00	0.00
Post-Online 2 (08.05.03)	1.00	0.40	0.20	0.00	1.00	0.60	0.00	0.00
Post-Online F2F Mean	**2.50**	**0.70**	**0.35**	**0.00**	**0.88**	**0.43**	**0.00**	**0.00**
D Group Mean	**2.42**	**1.89**	**0.18**	**0.50**	**1.19**	**1.11**	**0.13**	**0.00**
Pre-Test (05.03.03)	0.25	0.50	0.00	0.00	0.25	0.25	0.00	0.00
EFL Group Mean	**2.57**	**2.78**	**1.41**	**0.63**				
ENFL Group Mean	**2.02**	**1.83**	**0.35**	**0.00**				

*A: Elementary B: In-depth C: Judgement D: Strategy

Table 4: AMN422 Summary of Mean Values (N = 25, n = 24)

Online response behaviour

The online response behaviour showed that CT questions elicited deeper process learning and, therefore, students responded critically. However, D questions (which are expected to elicit declarative type responses) have also elicited deeper process learning especially during subsequent online discussion forums. This progressive shift is especially seen among ENFL students in AMN422 where the difference in mean values between the two online sessions is greater. Generally, the first online discussion forum did not exhibit higher-level CT, which may have been brought about by adaptation to the new medium. The EFL group overall showed more in-depth responses to both CT and D questions.

Post-online F2F response behaviour

Online discussions were followed by F2F discussions. A review of the mean values shows a shift in student response behaviour for both EFL and ENFL groups between F2F and online discussions. Because the group mean values are influenced by the online mean which tends to be high in participation, the post-online mean values are more indicative of what happens in the classroom following an online discussion session. The distribution of mean values shows how CT level responses increase for both EFL and ENFL following the first sessions.

Comparison between sessions: By comparing the rate and level of response for each of the F2F sessions, except for the first F2F session in AMN420, there appears to be a greater elementary level of CT response regardless of whether it was a CT or D question type for EFL and ENFL students. The variation in AMN420 may have been brought about by the high rate of participation in the first online session.

EFL and ENFL response to CT questions: By analysing the mean values according to question type, the response behaviour of both EFL and ENFL groups can be determined. The mean values also show that:

- EFL groups responded accordingly when asked CT type questions but responded more in-depth compared to the ENFL group particularly in AMN422 and to some degree in AMN420.
- AMN420 and AMN422 students show that EFL groups overall show higher CT response levels compared to the ENFL group.

EFL and ENFL response to D questions: When asked D questions, most groups responded more at elementary levels than in-depth in the post-online F2F compared to their response CT questions. Again, although elementary level CT responses were high, in-depth responses were also given by both groups, with higher tendencies by EFL groups. Therefore, it appears that the initiative to respond makes students go beyond the elementary level of processing.

To test the hypothesis of whether online discussion forums can facilitate CT in F2F classroom discussions, pre- and post-treatment comparisons of post-online discussions were conducted. A number of limitations determined the sampling and treatment design, such as issues of equity in using videos and online discussion forums, and access to the same class, subject and teacher. It was not possible to conduct a split-group sampling and have a separate control group. One group sampling with pre- and post-data analysis using the two-tailed t-Test was conducted. Figure 1 shows that for AMN 420, the t-Test scores fell below the p-value (p=2.353) at the 0.10 level of significance set for this study. Therefore, there was no significant difference between the pre-test and post-treatment data for both question response types. On the other hand, there was a significant difference between the pre- and post-test response values to CT type of questions for both EFL and ENFL groups in AMN422 at a 0.10 level of significance. Although D questions may have shown to elicit deeper process learning it was not significant enough.

The pre-test survey findings show that overall AMN422 students use online discussion forums less frequently (1–<1/month). In order to determine whether more treatment resulted in better transference of deeper process learning, overall critical thinking, a comparison between AMN420 and AMN422 group means for EFL and ENFL was conducted. No significant difference was found between groups and between classes.

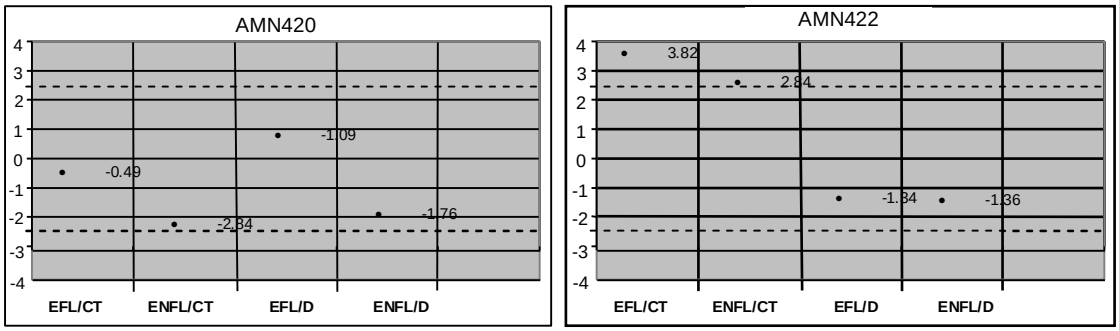

Figure 1: t-Test values for AMN420 and AMN422 EFL and ENFL groups

The results indicate that it is not the amount of exposure that contributes to students engaging in critical thinking but the style of questions that provoke the appropriate critical thinking type responses. A review of the student distribution shows that AMN422 had a higher percentage of international students compared to AMN420. Therefore, the effects of the online discussion forum in facilitating CT may be greater.

Post-treatment survey

In order to determine student perceptions and their subjective preferences to online discussion forums and the role it plays in improving their critical thinking, a survey was conducted at the end of the study. Students were asked how confident they were in participating in F2F discussions. A majority of ENFL students show a general lack of confidence, with 75% of responses as 'not confident'. When asked the barriers to their participation, lack of fluency in the English language and lack of time were predominant reasons. Other reasons given were, 'Some students seem to know it all and I don't want to get shot down'; timidity; and fear of being embarrassed in front of others were also reasons given by an EFL student. When asked about their perception of their response to context-related problems or issues of the subject matter, the EFL group felt they generally contributed across all levels of CT with 100% of students feeling they sometimes gave judgment to strategic type responses. The ENFL group, although having contributed across all CT levels, felt they were doing so less frequently. More than the classroom, students in both groups felt overall that they were contributing at higher CT levels online but this perception was higher among ENFL students at 75% compared to 57% for the EFL group. This is reflected in how all respondents felt more confident in using online discussion forums. Again 100% of the ENFL group felt that online discussion forums allowed them to think more critically and provided them with better preparation for the classroom discussion. Some EFL students felt the online discussion forums did not make a difference (43%). Finally, students were asked if the video segments gave a sense of real-world advertising. The Australian videos did not seem to be reflective of the practice that international students would encounter in their countries of origin, with only 25% (versus 71% for EFL students) agreeing to have real-world relevance. In terms of the usefulness of the videos and online discussion forums as a learning tool, 100% of ENFL students versus 43% of the EFL group agreed.

Conclusion and implications for further study

Overall, the findings indicate that to engage students in the process of critical thinking, appropriate instructional techniques must be applied. Results of the data analysis can be summarised as follows:

- Questions designed to elicit critical thinking responses will initiate students into thinking critically. The combination of strategic questioning and providing appropriate feedback responses are effective strategies to develop higher-order thinking skills. They provide an avenue for ENFL students to practice their CT skills which leads to information being processed in long-term memory and can then be drawn from during classroom discussions. When used in online environments it facilitates deeper process learning that can translate into the classroom environment.

- ENFL students perceive online discussion forums as useful learning tools that can assist them in developing their critical thinking skills because they had time to prepare and process the information and, therefore, developed greater confidence for face-to face classroom discussions. Case studies (in this case using media), although highly accepted by ENFL students, need to be globally or more internationally contextualised to make it more relevant for this cohort of students allowing them to better engage in the discussions.

The study was limited by a number of factors: the sample used was discipline specific and therefore, convenient and purposive sampling methods were used as controls to maintain reliability of treatment by using the same teacher, and the lack of a control group due to equity reasons in applying videos and online discussion forums for teaching the subjects. Although limited, this pilot study provides foundational data that can be used as the basis for further research. A larger sampling that will represent various sub-disciplines in Advertising and other business disciplines would be more generalisable and applicable to a larger population. Further research using a control group would be recommended in a larger study to remove the effects of maturation. The data in this study implies there are more aspects of critical thinking that need to be explored within an online environment and how critical thinking translates into the boardroom. One principle that can be derived from this pilot study is that the use of strategic instructional techniques for facilitating reflective, organised and thoughtful processes in problem solving is a key to critical thinking development.

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